CLAIMS

1. Process for separation of a monomer comprising at least one double bond from a composition Z comprising said monomer and at least one impurity which is different to said monomer, comprising the steps:

   - bringing said composition Z into contact with an additive, wherein said additive has

     -- a melting point of at most 150 °C and

     -- a vapour pressure of at most 1 mbar at a temperature of 20 °C,

     by forming a separation phase as well as

   - separating said monomer from said separation phase.

2. Process according to claim 1, with said additive comprising at least

   i. an ionic liquid or

   ii. a highly branched polymer or

   iii. a mixture of at least two thereof.

3. Process according to claim 2, wherein said highly branched polymer has at least 3 repeating units per molecule, each comprising at least three possible binding sites, wherein at least three of said repeating units are each attached via at least three possible binding sites to at least three other repeating units.

4. Process according to claim 2, wherein said highly branched polymer has at least 3 repeating units per molecule, which have respectively at least three possible binding sites, wherein at least three of said repeating units have at least two possible binding sites.

5. Process according to claim 2, wherein said ionic liquid is liquid at a temperature of 20 °C and has a viscosity in a range from 1 to 10,000 mPa×sec.

6. Process according to claim 1, wherein the separation of said monomer from said composition Z which has been brought into contact with said additive occurs by distillation or by extraction or crystallisation or a combination of at least two thereof.

7. Process according to claim 1, wherein said additive is brought into contact with said composition Z, said additive being in a quantity in a range from 0.01 to 95 wt.% based on the total weight of the additive and the composition Z.

8. Process according to claim 1, wherein said additive is recycled.

9. Process according to claim 8, wherein said recycling of said additive occurs by a separation step requiring energy input.

10. Process according to claim 1, wherein said monomer is (meth)acrylic acid.

11. Process according to claim 1, wherein said composition Z is an acrylic acid-comprising composition ZAA based on

(γ1) 5 to 99.994 wt.% monomeric acrylic acid, and as impuritiy

(γ2) at least 0.001 wt.% of at least one acrylic acid oligomer,

(γ3) at least 0.001 wt.% acetic acid,

(γ4) at least 0.001 wt.% propionic acid,

(γ5) at least 0.001 wt.% of at least one aldehyde,

(γ6) at least 0.001 wt.% maleic acid or maleic acid anhydride,

(γ7) at least 0.001 wt.% of at least one by-product which is different from the components (γ1) to (γ6) and

(γ8) a residual quantity of a fluid and

wherein the sum of the components (γ1) to (γ8) amounts to 100 wt.%.

12. Process according to claim 1, wherein at least one impurity is depleted.

13. A device for synthesis of a monomer comprising the following components in fluid-conducting assembly:

(δ1) a monomer synthesis unit (1) comprising a gas phase monomer synthesis unit (1a) with a quench unit (2) following said gas phase monomer synthesis unit (1a), or

(δ2) a liquid phase monomer synthesis unit (1b),

(δ3) optionally a first purification unit (3) following said liquid phase monomer synthesis unit (1b) or said quench unit (2),

(δ4) a first monomer separation unit (4), comprising as components:

(δ4_1) a conduit for a monomer-comprising composition Z (5) connected with said liquid phase monomer synthesis unit (1b) or with said quench unit (2) or with said optionally present first purification unit (3),

(δ4_2) an additive conduit (6),

(δ4_3) a contact region (7) which receives said monomer-comprising composition conduit (5) and said additive conduit (6),

(δ4_4) a conduit (8) exiting said contact region (7) for separated monomer.

14. Device according to claim 13, wherein said device comprises as further component (δ5) a recycling unit (12) for said additive, which in turn comprises the following components:

(δ5_1) an inlet (13) for a composition comprising said additive, which is connected in fluid-conducting manner to a separating element (14),

(δ5_2) exiting said separating element (14), an outlet (15) for said additive, which is connected in fluid-conducting manner to said additive conduit (6) or said contact region (7),

(δ5_3) exiting said separating element (14), an outlet (16) for said monomer, which is connected in fluid-conduction manner with said conduit (8).

15. Use of an additive which has

- a melting point of at most 100 °C at a pressure of 1 bar and
- a vapour pressure of at most 1 mbar at 20 °C,

as separation aid for the separation of at least one monomer comprising at least one double bond from a monomer-comprising composition.

16. Monomer obtainable by a process according to claim 1.

17. Fibres, formed bodies, films, foams, water absorbing polymers, special polymers for the areas waste water treatment, dispersion dyes, cosmetics, textiles, leather processing or paper manufacture, detergents or hygiene

articles, at least based on or comprising (meth)acrylic acid obtained by a process according to claim 1.

18. Use of (meth)acrylic acid obtainable by a process according to claim 1 in or for manufacture of fibres, formed bodies, films, foams, water absorbing polymers or hygiene articles, detergents or special polymers for the areas waste water treatment, dispersion dyes, cosmetics, textiles, leather processing or paper manufacture.